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Brown Rot of Peaches and Plums.

C. C. NEWMAN.

Address all communications to

S. C. EXPERIMENT STATION, Clemson College, S. C.

Freight and Express Office: Calhoun, S. C.

Telegraph Office: Clemson College.

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The Brown Rot of Peaches and Plums.

(*Monilia fructigena Persoon.*)

In many sections of the State, the peach crop has been a total failure, on account of the fruit rotting before reaching maturity. In other sections a loss of from forty to sixty per cent. has been reported while some sections have only suffered slight loss.

Last year, the disease was more destructive than usual on account of the continuous rains, which made the conditions more favorable for the germination of the spores and the development of the fungus. In orchards that have never suffered serious loss from Brown Rot until last year, fully seventy-five per cent. of the fruit was destroyed, and the trees themselves badly injured.

Brown Rot (*Monila fructigena Persoon*) of peaches and plums, is caused by a fungous disease which is propagated by means of spores (seed) that are produced by the thousand on the surface of the decaying fruits. These little spores are extremely small, and so light that the slightest breeze or jar will set them free and scatter them through the orchard.

If any one of these little spores should chance to lodge on a peach or plum, and the conditions surrounding it should be favorable for its germination, the disease would be produced, and the fruit caused to rot. The wind and insects are the principal agencies by which the spores are scattered through the orchard and the disease caused to spread.

For the last three years experiments have been conducted here in combatting this disease, and the results show that with proper treatment it can be controlled at very small cost.

Some growers, who have never sprayed their fruit stand by and see a large per cent. of their crop destroyed every year by Brown Rot, say they cannot afford to spray, while the truth is they can't afford not to spray.

It is no longer an experiment, but is a recognized fact, that this disease can be controlled when properly sprayed with Bordeaux Mixture.

Cost of Spraying.

The idea that spraying is very expensive is unwarranted, as can be seen by noting the actual cost of spraying as given below.

The cost of spraying will, of course, depend upon the size of the trees to be sprayed. It requires one and one-half gallons of Bordeaux Mixture to thoroughly spray an average size six-year-old peach tree when it is in full foliage. The first and second applications, being made before the trees have put on any foliage, will require much less of the mixture than will be necessary for the third and fourth applications. The amount of Bordeaux Mixture necessary for thorough spraying will increase with each application, as the trees put on more foliage, and thereby increase the amount of surface to be sprayed.

Copper sulfate costs seven cents per pound in fifty or hundred pound lots, and the best quality of quick-lime will cost less than one-half cent per pound. Our best results have been obtained from Bordeaux Mixture made by the following formula, which costs twenty cents per barrel:

2½ lbs. copper sulfate (blue stone) @7c	17½c.
5 lbs. quick lime @½c	2½c.
50 Gallons water	
	20 c.

Two men, one to drive the wagon and operate the pump, and the other to do the spraying, can in one day apply from fourteen to sixteen barrels of Bordeaux Mixture.

Then the cost of one day's spraying would be as follows:

Fourteen barrels Bordeaux Mixture @20c	$2 80
One man to do the spraying @75c	75
One man to operate the pump @50c	50
One horse @50c	50
Total cost	$4 55

As it takes on an average one and one-half gallons of Bordeaux Mixture for an average size six-year-old peach tree, then fourteen barrels would spray between four hundred and four hundred and twenty six-year-old trees.

In spraying larger trees that are nine or ten years old, and still in good condition, it will take nearly twice as much of the Mixture as

it would for six year trees, and of course will take about twice as long to spray them.

The cost of four sprayings for the six year trees would not be more then six cents per tree; and the cost of four applications on the ten year trees would not average more than twelve or thirteen cents per tree.

Bordeaux Mixture.

Many different formulae for making Bordeaux Mixture have been recommended, but it must be remembered that the foliage of the peach is more sensitive than that of other fruits and serious damage will result if the solution is too strong.

We have used three pounds copper sulfate and six pounds of lime to forty-five gallons water, but find some damage was done to the foliage of all the varieties to which it was applied, with the exception of Chinese Cling, Chinese Free and Gen. Lee. These three varieties showed no bad effects, while slight injury was noticeable on the foliage of forty-seven varieties.

Where two and one-half pounds of copper sulfate was used, no injurious effects were noticeable and the disease was held in check as well as where the stronger formula was used.

Our best results have been obtained where the *first application* was from Bordeaux Mixture made from the following formula: *6 lbs. copper sulfate, 6 lbs. lime and 45 gallons water.* The applications that followed were made with Bordeaux that contained *2 1-2 lbs copper sulfate, 5 lbs lime and 45 gallons of water.*

Preparation of Bordeaux Mixture.

Place two and one-half pounds of copper sulfate in a cloth sack and suspend in a *wooden* vessel containing twenty-five gallons of water, so that the copper sulfate will be covered with the water, and it will dissolve in about three or four hours.

Slake five pounds of quick lime in a small quantity of water, care being taken that a good smooth paste is made, and is free from dirt and lumps. When the lime is slaked add enough water to make twenty gallons.

When the copper sulfate has dissolved and the lime paste has been diluted to twenty gallons, the two are poured slowly together and mixed thoroughly by stirring for several minutes.

When Bordeaux Mixture is to be used in large quantities, much time will be saved by making a stock solution of both lime and copper sulfate. To make a stock solution of copper sulfate, take fifty pounds and dissolve in a barrel containing fifty gallons of water. Then each gallon of water will contain one pound of copper sulphate.

The stock solution of lime is made very much in the same way. Weigh out one hundred pounds of quick lime and slake well, making a smooth paste, that is free from lumps and trash, then add sufficient water to make fifty gallons. Then each gallon of water will, of course, contain two pounds of lime.

To make one barrel of Bordeaux from the stock solutions of lime and copper sulfate, take two and one-half gallons of the copper sulfate stock and dilute to twenty-five gallons.

Now take two and one-half gallons of the stock solution of lime and dilute to twenty gallons.

The two are then poured slowly together and stirred thoroughly.

How and When to Spray.

First Spraying—Just before buds open.

Second Spraying—When fruit is well set.

Third Spraying—About two weeks later.

Fourth Spraying—When fruit begins to color.

Good results have been obtained where the first spraying was not done until after the fruit was set, but for best results the first spraying should be done before the buds open.

Four sprayings are all that are necessary for the early and medium ripening varieties, but those ripening later in the season should be sprayed five or six times.

Care should be taken that the trees are never sprayed while in bloom, for great damage would result. The spray would injure the pistils and stamens, and cause the fruit to drop off.

Thoroughness is the secret of success in spraying. Every twig and leaf on the tree should be thoroughly wet with the spray, keeping the nozzle moving slowly all the time to prevent applying too much at any one place. The nozzle should not be held at one place long enough to cause the Bordeaux to drip freely from the leaves, but as soon as the drip starts, the spray should be moved to other parts of the tree. Great waste is sometimes caused in this way by a careless or inexperienced sprayer.

Spraying can be done more satisfactorily on a clear, still day, and it

is useless to attempt it when the wind is blowing very hard, for then only one side of the tree can be thoroughly sprayed. One must depend largely on his own judgment as to when to spray. No iron clad rule can be laid down, as we cannot spray unless the weather conditions are favorable.

If the orchard is sprayed one day and we should have a day or two of rainy weather immediately following, it will be necessary to spray again just as soon as possible.

A thin coating of Bordeaux Mixture should be kept on the fruit until the ripening period, and when it is washed off by rain, it should be applied again as soon as possible. The disease spreads very rapidly in rainy weather and if the spraying should be neglected after a few days of such weather, coming about the time the fruit begins to color, the disease will spread unchecked and great loss of fruit will result.

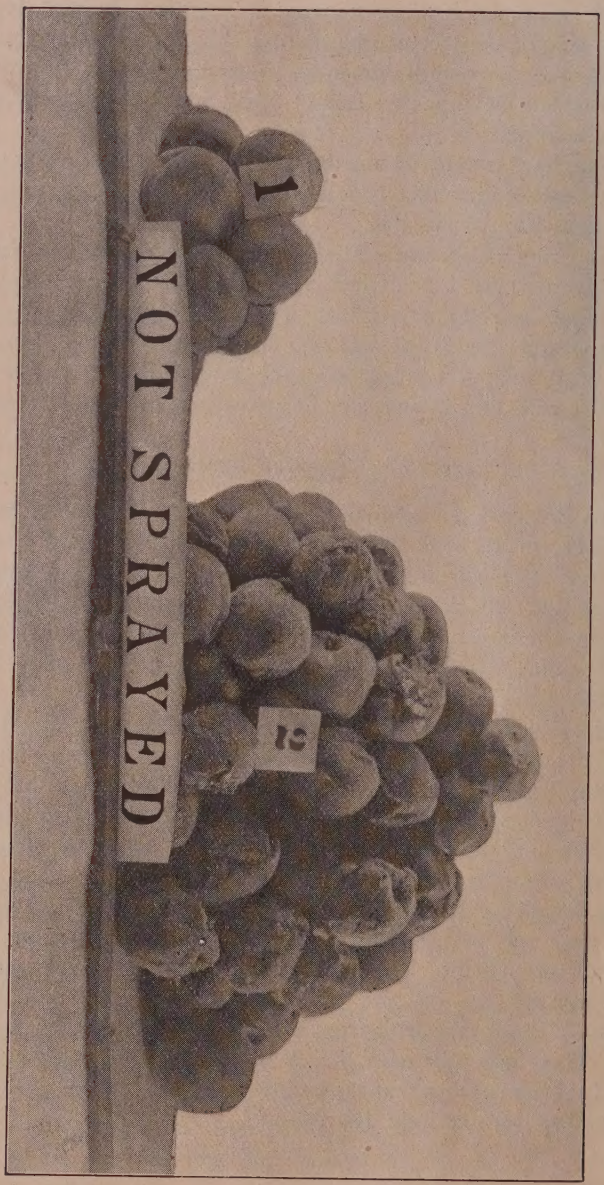
Importance of Destroying Decayed Fruits.

Brown Rot does not confine its attacks to the fruit alone, but also destroys the small twigs when the decayed fruit is allowed to remain on the tree. If the fruit is removed as soon as it begins to decay, the fungus will not attack the twigs to any great extent, but if allowed to remain on the tree the disease will extend down the twigs, and in some cases, large limbs are so damaged that it becomes necessary to remove them.

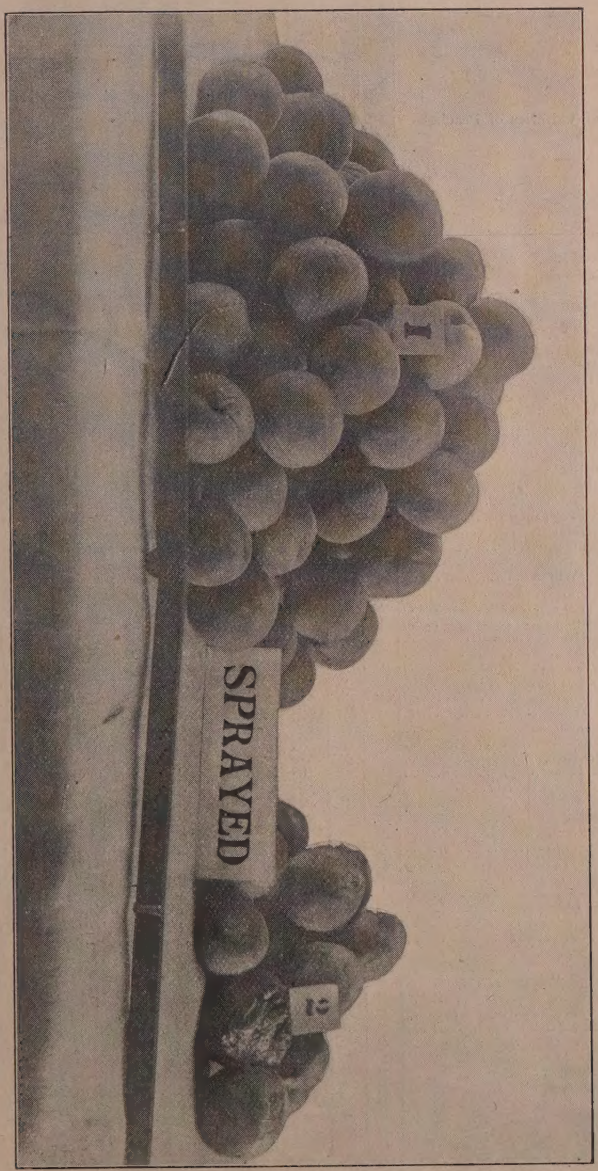
Great care should be taken to remove every dead twig and decayed fruit in the orchard as soon as possible and destroy them. The dead twigs and decayed fruit are covered with the little spores that would produce the disease the next year; and by destroying them and thoroughly spraying the trees before the bloom, the bulk of the spores will be killed. before the young fruits appear in the spring.

Plate I. Shows the fruit from a young tree that was not sprayed. There were only seven sound peaches on the tree, and more than a bushel of rotten fruit. The peaches were nearly grown before they started to rot.

Plate II. Shows the fruit from a young tree that was sprayed four times. There was little more than a bushel of sound fruit on this tree and only seven peaches that showed the slightest rot, and only two of that number were entirely destroyed.



Fruit from an unsprayed tree. (1) Sound fruit. (2) Rotten fruit.



Fruit from a sprayed tree. (1) Sound fruit. (2) Rotten fruit.

Name of Varieties of Peaches.	Sprayed Before Buds Opened March 14 and 15.	Sprayed After Fruit Had Set April 18 and 19.	Sprayed May 9 and 10.	Sprayed June 29 and 30.	Sprayed July 22 and 23.	Sprayed Aug. 12 and 13.	Per Cent. of Sound Fruit on Sprayed Trees.	Per Cent. of Sound Fruit on Unsprayed Trees.	Per Cent. of Sound Fruit Increased by Spraying.	Ripening Period.
Fluellen	"	"	"	....	....	....	90	40	50	June 16-25.
Beatrice	"	"	"	....	....	....	88	32	56	June 16-27.
Wager	"	"	"	....	....	....	89	41	48	June 18-27.
Arkansas Traveler	"	"	"	....	....	....	91	36	55	June 16-27
Waterloo	"	"	"	....	....	....	92	10	82	June 19-30.
Alexander	"	"	"	....	....	....	84	25	59	June 18-28.
Early Rivers	"	"	"	....	....	....	96	67	29	June 27 July 12.
Early Louise	"	"	"	....	....	....	90	18	72	June 27 July 4.
Hale's Early	"	"	"	....	....	....	78	3	75	June 28 July 8.
Parnell	"	"	"	....	....	....	77	20	57	June 27 July 12.
Yellow St. John	"	"	"	....	....	....	82	24	58	July 3-22.
Lady Ingold	"	"	"	....	....	....	83	27	56	July 4-22.
Haynes	"	"	"	....	....	....	82	49	33	June 28 July 12.
Pineapple	"	"	"	"	....	....	73	44	29	July 8-22.
Mountain Rose	"	"	"	"	....	....	89	15	74	July 9-24.
Coles Early Red	"	"	"	"	....	....	73	26	47	July 10-20.
Amelia	"	"	"	"	....	....	88	30	58	July 16-25.
Elberta	"	"	"	"	....	....	94	60	34	July 22 Aug. 4.
Early Tillotson	"	"	"	"	....	....	89	50	39	July 8-27.
Early Newington	"	"	"	"	....	....	91	45	46	July 21-31.
Chinese Cling	"	"	"	"	....	....	85	10	75	July 20 Aug. 3.
Stump the World	"	"	"	"	....	....	87	40	47	July 20 Aug. 6.
Thurber	"	"	"	"	....	....	95	65	30	July 20 Aug. 4.
Foster	"	"	"	"	....	....	89	62	27	July 20-29.
Gen. Jackson	"	"	"	"	....	....	93	48	45	July 28 Aug. 10.
Great Eastern	"	"	"	"	....	....	92	55	37	July 24 Aug. 10.
Chinese Free	"	"	"	"	....	....	77	15	62	July 26 Aug. 12.
Burk	"	"	"	"	....	....	85	19	66	July 26 Aug. 7.
Gen. Lee	"	"	"	"	....	....	89	40	49	July 25 Aug. 9.
Globe	"	"	"	"	....	....	93	68	25	Aug. 8-23.
Reeves	"	"	"	"	....	....	84	45	39	July 20 Aug. 5.
Pallas	"	"	"	"	....	....	78	5	73	July 27 Aug. 11.
Lemon Cling	"	"	"	"	....	....	88	30	58	July 10 Aug. 26.
Old Mixon Cling	"	"	"	"	....	....	87	44	43	July 28 Aug. 12.
Old Mixon Free	"	"	"	"	....	....	88	39	49	Aug. 24 Sept. 8.
Berenice	"	"	"	"	"	....	90	60	30	July 30 Aug. 15.
Crawford's Early	"	"	"	"	"	....	93	45	48	Aug. 2-20.
Chair's Choice	"	"	"	"	"	....	92	67	25	Aug. 9-27.
Mrs. Brett	"	"	"	"	"	....	68	40	28	Aug. 9-29.
Snow Free	"	"	"	"	"	"	72	10	62	July 24 Aug. 7.
Snow White	"	"	"	"	....	....	74	15	59	July 23 Aug. 7.
Snow Cling	"	"	"	"	"	....	78	20	58	Aug. 14-30.
Wheatland	"	"	"	"	"	....	88	30	58	Aug. 1-10.
Crawford's Late	"	"	"	"	"	....	86	53	33	Aug. 6-30.
Vanzants	"	"	"	"	"	....	80	35	45	Aug. 10-31.
Muir	"	"	"	"	"	....	70	40	30	Aug. 12-30.
Keykost	"	"	"	"	"	"	86	32	54	Aug. 25 Sept. 10.
Fox Seedling	"	"	"	"	"	"	90	20	70	Aug. 25 Sept. 18.
Heath's Late White	"	"	"	"	"	"	83	18	65	Sept. 10-18.
Heath's Free	"	"	"	"	"	"	74	10	64	Sept. 5-21.
Wilkins	"	"	"	"	"	"	80	20	60	Sept. 5-23.
Tippecanoe	"	"	"	"	"	....	87	32	55	Aug. 10-28.
Beersmack	"	"	"	"	"	"	90	40	50	Sept. 8-20.
Salucy	"	"	"	"	"	"	80	31	49	Sept. 8-20.
Eaton's Golden	"	"	"	"	"	"	87	50	37	Sept. 18 Oct. 1.
Finley's October	"	"	"	"	"	"	94	40	54	Oct. 10-28.
Albright	"	"	"	"	"	"	90	28	62	Oct. 12-23.
Scott's October	"	"	"	"	"	"	82	42	40	Oct. 15-25.
Hawkin's W.	"	"	"	"	"	"	92	30	62	Oct. 22-30.

The following is all the equipment necessary for spraying peach and plum trees:

One high power "Barrel Pump."
Twenty-five feet of one-half inch hose.
One "Two Discharge Vermorel" Nozzle.
One "Ten Foot Extension Rod" in two sections.
One "Funnel and Strainer."

Those desiring catalogues and prices can get them from the following firms:

The Goulds Manufacturing Co., Seneca Falls, N. Y.
The Deming Co., Salem, Ohio.
John J. McGowan, Ithaca, N. Y.
Barnes Mfg. Co., Mansfield, Ohio.
Leggett & Bros., 301 Pearl St., New York City.
Field Force Pump Co., Lockport, N. Y.
Lenox Spray Co., Pittsfield, Mass.
Thomas Pepper, Hightstown, N. J.
F. E. Myers & Bros., Ashland, Ohio.
W. & B. Douglas, Middletown, Conn.

Plate III. Shows a spraying party at work. Two rows of ten-year-old peach trees are being sprayed at the same time with a double acting barrel pump.

C. C. NEWMAN, Horticulturist.